WHAT IS CLAIMED IS:

1. A mobile robot, comprising:

a communications module for transmitting a light source control signal to selectively control flickering of a plurality of light sources of a landmark array provided in a working space;

an image processing module for calculating image coordinates at least one of the plurality of the light sources by detecting the light sources, controlled to flicker in response to the light source control signal, from an image signal obtained by a camera;

a pose calculation module for calculating coordinates of the mobile robot using the calculated image coordinates and previously stored world coordinates of the light sources;

a motion control module for calculating a moving path for the mobile robot by applying the position coordinates of the mobile robot to previously stored spatial coordinates of the working space and controlling the mobile robot to move along the moving path; and

a main control module for controlling interoperations of the modules and general operations of the mobile robot.

2. The mobile robot as set forth in claim 1, further comprising a memory module for storing the world coordinates of the light sources, spatial coordinates of the mobile robot in the working space, and parameters calculated through camera calibration for compensating for distortion of a lens of the camera.

3. The mobile robot as set forth in claim 1, wherein the pose calculation module calculates translation and rotation of the robot by applying the image coordinates and the world coordinates to the specified position calculation algorithm.

4. The mobile robot as set forth in claim 3, wherein the pose calculation

algorithm is a certain transformation matrix equation that is obtained by constructing an extension model for obtaining a translation and a rotation of the camera using a world coordinate system and a camera coordinate system and applying the extension model to a formula for compensating for distortion caused by a lens of the camera.

5. A system for autonomous navigation of a mobile robot, comprising:

a landmark array comprising a plurality of light sources disposed in a certain area to selectively flicker;

a landmark array control module for controlling the light sources of the landmark array to flicker; and

a mobile robot equipped with a pose calculation module for selectively controlling the light sources of the landmark array to flicker by transmitting a light source control signal to the landmark array control module and recognizing a position of the mobile robot using the flickering light sources.

6. The system as set forth in claim 5, wherein the light sources are light emitting devices, including electro-luminescent devices and light emitting diodes, which emit light with a certain wavelength and a certain brightness.

7. The system as set forth in claim 5, wherein the light sources are each assigned with position information comprised of a specific identification number and world coordinates in a working space in which the landmark array is arranged.

8. The system as set forth in claim 5, wherein the landmark array control module comprises:

an access point for receiving and processing the light source control signal transmitted from the mobile robot; and

a light source control unit for controlling corresponding light sources to flicker in response to the light source control signal input from the access point.

9. The system as set forth in claim 5, wherein the pose calculation module calculates translation and rotation of the robot by applying image coordinates and world coordinates to a certain pose calculation algorithm.

10. The system as set forth in claim 5, wherein the mobile robot comprises:

a main control module for controlling an entire operation for pose recognition and moving according to an operation management algorithm for autonomous navigation of the mobile robot;

a communications module for transmitting a light source control signal to control light sources of the landmark array under control of the main control unit;

an image processing module for detecting feature points of the light source, controlled to flicker through the communications module, from an image signal obtained by a camera;

a motion control module for controlling the mobile robot to move under control of the main control module; and

a memory module for storing parameters calculated through camera calibration for compensating for distortion caused by a lens of the camera, world coordinates of the light sources, and spatial coordinates of the mobile robot in a working space.

11. The system as set forth in claim 9, wherein the pose calculation algorithm is a certain transformation matrix equation that is obtained by constructing an extension model for obtaining a translation and a rotation of the camera using a world coordinate system and a image coordinate system, and applying the extension model to a formula for compensating for distortion caused by a lens of the camera.

12. The system as set forth in claim 8, wherein the communications module and the access point are assigned with frequencies of a high bandwidth and transmit/receive data via the assigned frequencies, or the communications module and

the access point transmit/receive the light source control signal through infrared data communications using infrared radiation or through data communications based on wireless communications protocols, such as Bluetooth, which is a wireless local communications technology.

13. The system as set forth in claim 9, wherein the communications module and the access point are assigned with frequencies of a high bandwidth and transmit/receive data via the assigned frequencies, or the communications module and the access point transmit/receive the light source control signal through infrared data communications using infrared radiation or through data communications based on wireless communications protocols, such as Bluetooth, which is a wireless local communications technology.

14. The system as set forth in claim 10, wherein the image processing module comprises;

a camera equipped with a filter for filtering a wavelength of the light source from an image signal; and

a signal process unit for detecting the wavelength of the light source from the filtered image signal output by the camera.

15. A method for autonomous navigation of a mobile robot, comprising:

the first step of the mobile robot selectively controlling light sources of a landmark array arranged across a certain working space to flicker;

the second step of extracting image coordinates of a camera by detecting a light source controlled to flicker from an image signal input from the camera; and

the third step of calculating a current pose of the mobile robot with reference to the extracted image coordinates and previously stored world coordinates of the light source.

16. The method as set forth in claim 15, further comprising the fourth step of a motion control module determining a moving path to a destination using the calculated current position and controlling the mobile robot to move along the determined moving path.

17. The method as set forth in claim 15, wherein the first step comprises the steps of:

transmitting a light source control signal to a landmark array control module to control the specified one of the light sources of the landmark array to flicker; and

the landmark array control module controlling the specified light sources to flicker in response to the light source control signal.

18. The method as set forth in claim 15, wherein the second step comprises the steps of:

detecting feature points of the light source from the image signal captured by the camera;

determining whether the light source is detected by the camera using the feature points of the light source or not;

searching for the light source detected by the camera by sequentially controlling light sources near a previously tried light source to flicker if the first tried light source is not detected; and

extracting image coordinates of a detected light source from the image signal if any light source is detected.

19. The method as set forth in claim 15, wherein the third step comprises the steps of:

detecting position information of the detected light source;

calculating the pose of the mobile robot with reference to the calculated position of the mobile robot; and

ascertaining a precise position of the mobile robot by matching the calculated position of the mobile robot with spatial coordinate information of the working space previously stored in the mobile robot.

20. The method as set forth in claim 15, wherein the mobile robot detects two or more light sources by repeating the first and second steps so as to precisely ascertain the position of the mobile robot.